APPLICATIONS OF INFRARED THERMOGRAPHY AS INNOVATIVE TECHNOLOGICAL SOLUTION IN SPORTS INJURIES

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BACKGROUND

Infrared thermography IR is a technique, which allows us to get rapidly and non-invasive thermal images from objects or human beings. (Barnes, 1967). In Medicine, its usefulness as diagnosis tool was accepted decades ago (BenEliyahu, 1990), but other techniques with a higher efficiency -such as magnetic resonance or x-rays- ousted it. Nevertheless, the technological improvements on thermographic cameras and new studies on sport injuries are reinforcing new applications (Ring, 2006).

HYPOTHESIS

Infrared thermography could be used as means of monitoring and prevention of injuries, as well as sport workloads assimilation quantifier.

METHODS

In order to discover the applications of infrared thermography and its efficiency on sports, several studies have been carried out with professional basket and soccer teams, besides high performance athletes, judokas and gymnasts. We follow a protocol (Gómez Carmona, 2010) using a t335 FLIR camera to take the images, and Termotracker software to analyze them.

RESULTS

Taking as a base our results, we can enounce the four main applications of infrared thermography as innovative solutions:

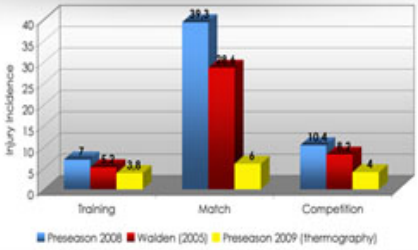
INITIAL PHYSICAL ASSESSMENT

Zones	T°C	ΔT
R Adductor	34,3	0,5
L Adductor	33,8	
R Rectus Fe	34,8	0,5
L Rectus Fe	34,3	
R Vastus M	34,3	0,5
L Vastus M	33,8	
R Vastus Lat	34,9	0,5
L Vastus Lat	34,4	
R Knee	32,0	-0,1
L Knee	32,1	

Example of one soccer player assessed with IR the first day of the 2009 preseason. Thermal asymmetries were detected on his right leg. Two weeks after he was **injured** on his right thigh.

INJURY PREVENTION METHOD

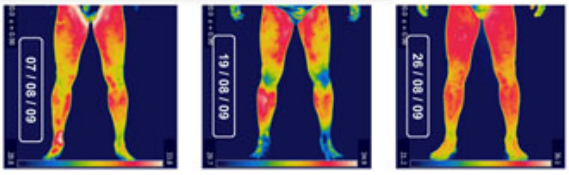
Application of IR as means of injury prevention method in one soccer team during one preseason (Gomez Carmona et al, 2011). **90% less** days of injuries comparing with the same team the year before



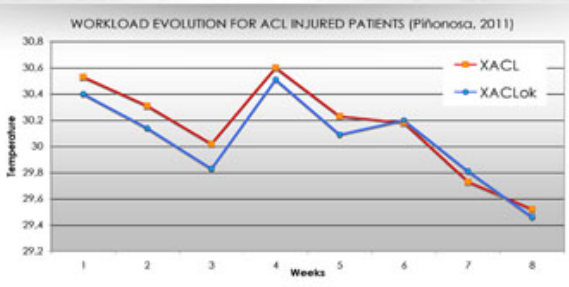
INJURY MONITORING

Zones	T°C	ΔT	T°C	ΔT	T°C	ΔT
Right Ankle	34,2	1,9	32,5	0,3	32,0	-0,2
Left Ankle	32,3		32,2		32,2	

Thermal evolution of an ankle sprain in 19 days (**less time than expected**).



EXERCISE WORKLOAD ASSIMILATION QUANTIFIER



CONCLUSIONS

Despite the encouraging results, further investigations should be done in order to: firstly knowing better all influence factors, which make nowadays infrared thermography an imperfect technique; secondly polishing up the protocol by researching in other sports and reinforcing those results with deep and longer researches.

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